



STAN-EVAL NOTES
CIVIL AIR PATROL VIRGINIA WING
UNITED STATES AIR FORCE AUXILIARY
7401 Airfield Drive
Richmond, Virginia 23237-2250
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Danville Flight Clinic: We are planning a funded flight clinic at KDAN on Saturday, 20 October. We will have several check pilots and instructor pilots to help you get your check ride done. This clinic is open to any VAWG pilot needing a check ride. Pilots needing any of the following may sign up.

- Form 5 (annual or abbreviated)
- Form 91
- Tail Strike Avoidance training

We will also be available to provide instructional flights if you think you need some help with proficiency. Send your name, email, phone, CAPID, and type of flight requested to steve.hertz@ngc.com.

G1000 Ground School: We hosted a G1000 ground school at the Rick Aviation flight school classroom at Newport News International Airport (PHF) 8 September. We had 18 participants in this class taught by Capt Susan Parson and Major Stephen Hertz. Thanks to Niko Kubli for organizing this and to all the attendees for taking the time to attend.

Back to Basics – Performing a Go Around: One of the maneuvers required on a Form 5 check ride is a go around. We learned this basic maneuver before we ever soloed as it is such an important one. A go around is basic to safety as it provides a “get out of jail” card to a pilot when an approach and or landing starts to go bad (or the tower tells you to go around).

Go arounds usually happen pretty quickly so your first reaction should not be to reach for the checklist. But the actions you take depend on the aircraft you are flying and the configuration it is in at the time of the go around. In most cases, you will have configured the aircraft for landing which means you already have the prop at high RPM, mixture is rich, flaps are full, carb heat is on, and cowl flaps are closed.

For our C172 aircraft, going around means applying full power smoothly and promptly, raising the flaps to 20 degrees (or if they are already at 20 or less, leave them alone), getting the carb heat off if it has been applied, and re trimming as necessary. These actions allow you to achieve full power and full performance. Once you’ve established an appropriate climb, it’s time for the checklist.

Balked Landing

1. Throttle..... Full Open
2. Carb Heat..... Cold
3. Wing Flaps...20° (Immediately)
4. Climb Speed60 KIAS
5. Wing Flaps...10° (Until Obstacles are Cleared)
6. Wing Flaps....Retract (After reaching a safe altitude and 65 KIAS)

For our C182 and GA8 aircraft it’s similar but slightly different. You apply full power smoothly and promptly, raise the flaps to the second notch for the C182 and first notch for the GA8 (or leave them alone if the C182 is at the second notch or less), open the cowl flaps and re trim as necessary. Once you’ve established an appropriate climb, it’s time for the check list.

Balked Landing

7. PowerFull Throttle & 2400 RPM
8. Wing FlapsRetract to 20°
9. Climb Speed55 KIAS
10. Flaps ..Retract Slowly (above 70 KIAS)
11. Cowl FlapsOpen

Or for the GA8:

Balked Landing

1. Power: Full throttle 2700 RPM
2. Wing Flaps: Retract slowly (Approx. 3 sec per setting)
3. Airspeed: Est. normal climb speed (initially 71 KIAS)

Observers should note that although the pilot should start the immediate actions right away sans checklist, an observer that is on the ball will be pulling out the checklist and reading the immediate actions to the pilot and cross checking to make sure all items are completed. That can be a big help to a pilot in a stressful situation.

Although each aircraft type is slightly different, the approach is the same. Get all your power (full throttle, carb heat off, mixture rich), establish the appropriate climb attitude, get rid of any excess drag (e.g. flaps should be in the takeoff, not landing, configuration) and re trim as necessary. Easy, right? Yes, but because go arounds can be a time of stress, pilots sometimes botch it.

Mistakes observed on recent Form 5's include the following:

- Pilot applies power correctly but forgets to set the flaps. This results in a slower climb. A C172 with full flaps even at high power can barely climb. A C182 or GA8 does better but not great.
- Pilot forgets to set the carb heat to cold. The engine won't develop full power with carb heat on.
- Pilot had not done the before landing check list and has the prop at less than high RPM. Applying full throttle will not develop full power and if the RPM is too low the pilot may damage the engine (high manifold pressure and low RPM are not good for engines).
- Pilot had not done the before landing checklist so the mixture is still lean. Running full power at lean settings means you won't get full power and the engine might start complaining rather menacingly. Remember, an engine will run at low power at very lean settings quite happily but high power requires a rich setting. Running full power excessively lean will stop the engine. This is not a good outcome on a go around. That being said, it's important to enrichen the mixture but not necessarily go full rich. You want full power and at high density altitudes full power may be at less than full rich.
- Pilot does everything right but forgets to open the cowl flaps. Of all the mistakes to make this is the least. Engine will start running hot after some time but you should be well on your way by then and plenty of time to correct the setting.
- On the go around the aircraft pitches to an excessively high attitude after full power is applied risking a power on stall. Pilots should be ready for the pitch up when they apply full power. In the Maule MT7, it can be quite exciting if you are not ready for it. This is caused by the airplane being configured for landing with more and more up trim applied as you slow the aircraft for landing. If you quickly apply power, the nose can pitch up quite suddenly – be ready for that and get the a/c re-trimmed as quickly as possible.

Don't wait for your next Form 5 to do this maneuver, practice it. You WILL need it.

What do G limits really mean?: We all understand that we cannot exceed the G limits in the aircraft we fly but it's of interest to look a little deeper to better understand what this really means. Our CAP aircraft are certified

for the normal category which can be found in the POH as 3.8 G's positive and 1.5 G's negative (flaps down can reduce these numbers). These G limits are good up to gross weight so let's do a little math. A C182T gross weight is set at 3100 lbs. So if we now go fly and do a steep turn so that we are pulling right at 3.8 G's we are within the envelope. 1 G for a C182T means the wing must support 3100 lbs (gross weight) while at 3.8 G's it's 3.8 times the gross weight or 11,780 lbs. That means the spar and the wing structure must be able to carry 11,780 lbs. That's a lot of weight!

What you won't find in the POH is that our aircraft are built with a margin in them so they will actually carry more (don't try this at home). The 3.8 G's is the design limit which means that metal starts deforming (bending) beyond this but won't break (hopefully). They don't publish this for our aircraft but most design limits have a 50% margin, e.g. the wings won't break off until you reach 1.5 X 3.8 G's or 5.7 G's or at gross weight the wing breaks around 17,670 lbs. Between 3.8 G's and 5.7 G's you will suffer structural damage (e.g. the wing bends) but won't break till 5.7 G's (the plane may be uncontrollable with a bent wing). I don't want to test this and neither should you. Bending a wing is not a good thing and you don't get your money back if the wing fails at 5.0 G's instead of 5.7 G's. And of course our aircraft are old and metal fatigue takes its toll so it isn't as strong as it was when it was new. If you want to pull G's like that, go buy an Extra 300 or a Decathlon.

We know that at 3.8 G's at full gross our C182 wing must be designed to be strong enough to carry 11,780 lbs. So what happens if I'm not at gross? Can I pull more G's? Let's say the C182T is only carrying partial fuel and just the pilot and weighs a mere 2500 lbs. Since I know that the wing can carry 11,760 pounds then I should be able to pull 11,760/2500 G's or 4.7 G's? Well, you have just enough knowledge to be dangerous. It is true that the wing should safely carry 11,760 and so the WING can go to 4.7 G's at 2500 lbs but that's not what the POH says and there are very good reasons why G limits published in POH's are not a function of gross weight. Since the aircraft is certificated in the normal category you cannot safely pull more than 3.8 G's no matter how lightly loaded you are. Why not?

The answer is that the G limit applies to more than just the wing. The G limit applies to the entire aircraft. Consider the engine mounts. Whether you are at gross or at 2500 lbs, the engine weighs the same. The 3.8 G limit tells you how strong the engine mounts must be. So even if you are "light", the engine still weighs the same and if you go past 3.8 G's the wings might be ok but the engine mounts are not and the engine falls off. As you go out of control without the engine up front it will be of little solace that the wings are still on. The same logic applies to the empennage, the seats you are sitting on, and lots of other stuff you haven't thought of. G limits apply to every structural element of the airplane and so reducing the weight of the airplane may reduce the stress on the wing but it does nothing for other structural limits. So when the POH says 3.8 G's believe it. A little knowledge will kill you. You need to know the whole story.

Watch out for Airshow Spectators (LtCol G. Jackson): We often display our CAP aircraft at local airshows and allow spectators (usually kids) to sit in the cockpit. Recently, we had an incident where the GA8 406MHz beacon was activated when an airshow spectator who was in the airplane at the Langley Airshow activated the ELT by pushing the ON button on the ELT alarm on the dash.

Col Carter has emphasized that no aircraft is to be open and displayed to the viewing public unless a pilot currently Form 5'd in that aircraft is immediately in attendance so as to ensure we do not have circumstances such as this recur. This is now our 3rd episode of well meaning people engaging a switch in a CAP aircraft on static display causing something to happen. We previously had two incidents involving burned pitot tube covers and damaged pitot tubes when pitot heat was turned on by spectators.

Prior to allowing spectators in the cockpit, it is wise to put everything you can in the baggage compartment and lock it. Items like POH's, flight bags, headsets, and so forth get easily misplaced or may even walk off. Keeping control locks in place may also be advisable but won't allow you to demonstrate what the controls do. Pilots should watch any spectator in the aircraft to ensure that no switch is touched. If you are the responsible pilot and find you must leave the aircraft temporarily, lock the aircraft before you leave to ensure no spectator has access to the cockpit. A thorough pre flight of the cockpit, passenger compartments, and baggage

compartments should be made after the show to ensure all switches are correct, everything is in its proper place (fire extinguishers, documentation, and so forth), and nothing is amiss.

Updates to the AIM (FAA): Recently a pilot informed us of changes to the Aeronautical Information Manual (AIM) concerning the use of lights and transponder while moving on the surface of an airport. This pilot learned from a Designated Pilot Examiner (DPE). Although it is your individual responsibility to stay aware of procedures in the AIM, we thought you would want to know about this particular safety initiative!

The AIM, which is available at http://www.faa.gov/air_traffic/publications/atpubs/aim/Index.htm, is updated in February and July of each year, and included in the last February change was an updated description of the "Operation Lights On" pilot safety program. In section 4-3-23, Use of Aircraft Lights, paragraphs (c), (e), (f) and (g) describe the use of lights while on an airport. We invite you to go to the AIM and read each of these paragraphs. For example, paragraph (e) states, prior to commencing taxi, it is recommended to turn on navigation, position, anti-collision, and logo lights (if equipped). To signal intent to other pilots, consider turning on the taxi light when the aircraft is moving or intending to move on the ground, and turning it off when stopped or yielding to other ground traffic. Strobe lights should not be illuminated during taxi if they will adversely affect the vision of other pilots or ground personnel.

Furthermore, the use of your transponder while taxiing is recommended in paragraph 4-1-20. It says, in part, Civil and military transponders should be turned to the "on" or normal altitude reporting position prior to moving on the airport surface to ensure the aircraft is visible to ATC surveillance systems.

We encourage you to keep abreast of the periodic changes to the AIM, and they make it easy by providing a change summary page for each change. We appreciate these items being brought to our attention so that we could share them with you.

An Embarrassing Lesson (NASA ASRS): Taxiing and flying an airplane will always involve some degree of multi-tasking, but this C172 pilot learned an embarrassing lesson when the "heads-down" usage of an electronic tablet conflicted with the "heads-up" requirements of safe taxiing.

"We were cleared by Ground to taxi on the outer ramp area to Taxiway Bravo to Runway 22 and hold short. It's a "no-brainer" taxi route and there were no other aircraft taxiing out. I was with another pilot and was showing him the information I had available on my iPad with ForeFlight. I was showing how I had the enroute charts for our trip and then went to the checklists, also on the iPad. I was definitely multi-tasking as I taxied and demonstrated the software. I was aware of the runway area approaching but missed the hold short line until Ground said, "[Callsign], stop. Stop!"

I would never dream of texting on my phone while driving, but wasn't this sort of the same thing? There was no traffic for the runway, but it was still an embarrassing lesson learned."

(Ed note: A lot of us fly with our trusty iPads but they can be a distraction as this pilot demonstrated. Keep your head out of the cockpit!)

How ASOS measures ceilings (taken from Pilot Workshops.com): How are automated ceiling reports made by an ASOS? How large an area do they cover?

"Even though the automated surface observation system or ASOS creates a completely new observation every minute, they must have adequate sensor samples to develop an accurate observation for the airport. In order to provide a representative observation, the automated hardware must continuously collect the sensor's real-time data over a period of time. The automated system applies an algorithm to the collected data to extrapolate the weather to cover a wider area.

This is especially important when considering the observation for sky cover and cloud height. When approaching an airport, for example, pilots don't necessarily want to know what's happening instantly

over the sensor since it may not always be representative of the sky condition throughout the airport's terminal area and it might vary quite a bit between reports.

Automated systems employ an upward-pointing laser beam ceilometer to determine sky cover and cloud height. The cloud height indicator, for instance, transmits approximately 9,240 pulses in 12 seconds, but it's not these individual samples that are used for the observation. Instead, this data is collected over a period of 30 minutes before an observation is considered acceptable.

Based on field studies, 30 minutes of data provides a fairly reasonable description of sky conditions. This means that the system will detect and process all the clouds (if any) passing over the sensor in the past 30 minutes. To account for the latest sky conditions, the result is biased by double weighting (or counting twice) the last 10 minutes of data.

Using the last 30 minutes of data in this way will allow the system to determine the height and sky cover included in the surface observation and becomes a reasonable estimate of the sky conditions that is valid over a three to five statute mile radius around the airport."

Articles for the VAWG Stan Eval Newsletter: We are always looking for brief articles of interest to VAWG pilots to include in this newsletter. CAP has many very experienced pilots and aircrew who have useful techniques, experiences, and tips to share. Please send your contribution to steve.hertz@ngc.com. If your article is accepted, you will get a pro rata share of the VAWG Stan Eval Newsletter subscription fees.